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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LOUDEN, CLIFFORD J

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/579,785	Applicant(s) NOZAKI ET AL.	
	Examiner CLIFFORD J. LOUDEN	Art Unit 3679	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05/26/2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Claim Objections

1. The claims are objected to as failing to comply with 37 CFR 1.75(i) because elements of the claims are not separated by line indentation.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claim 1, 3, 4, 10, 13, 14 & 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo, JP2-113123 in view of Rose, US 2,343,244. Sadatomo shows in Figs. 1-7 a shaft coupling comprising two axially opposed rotary members (2 & 4) having rotation axes (2' & 4') that can be positioned so as to be parallel to and not aligned with each other, said rotary members having axially opposed surfaces (6 & 8) axially facing each other, each of said axially opposed surfaces being formed with a plurality of guide grooves (7a-7d & 9a-9d) each axially facing and extending perpendicular to one of the guide grooves formed in the other of said axially opposed surfaces, rolling elements (12a-12d) each disposed between a pair of axially facing guide grooves at a portion where the pair of axially facing guide grooves cross each other so as to roll while being guided by the pair of axially facing guide grooves, and a retainer (10) for restricting movements of said rolling elements in a radial direction of said rotary members, whereby power is transmitted between said rotary members through said rolling elements.

Sadatomo does not expressly disclose the retainer has elongated holes formed therein, each of said elongated holes extending perpendicular to a diametric direction at a location

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corresponding to the portion where the respective pair of axially facing guide grooves cross each other, and wherein rolling elements are respectively rollably disposed in said elongated holes.

Rose teaches a shaft coupling having a retainer (18/19) having elongated holes (25) formed therein, each of said elongated holes extending perpendicular to a diametric direction at a location, and wherein said rolling elements (27) are respectively rollably disposed in said elongated holes. At the time of the invention, it would have been obvious to one having ordinary skill in the art to modify the holes of Sadatomo to be elongated as taught by Rose and extending perpendicular to a diametric direction at a location corresponding to the portion where the respective pair of axially facing guide grooves cross each other in order to provide additional degrees of freedom of articulation of the retainer thereby increasing the versatility of the coupling in general.

Claim 3: Sadatomo shows in Fig. 2 each of said guide grooves (7a-7d & 9a-9d) extends in a straight line in a longitudinal direction thereof.

Claim 4: Sadatomo shows in Figs. 2-4 each of said guide grooves (7a-7d & 9a-9d) extends at an angle of 45 degrees with respect to a radial direction of said rotary members (2 & 4).

Claim 10: Sadatomo shows in Figs. 1, 5, 6 & 7 said retainer (10) has flat contact surfaces which contact the respective rolling elements (12a-12d).

Claim 13: Sadatomo shows in Figs. 7-8 an axial restrictor (12a''-12d'') for restricting the axial distance between said rotary members within a predetermined range.

Claim 14: Sadatomo shows in Figs. 7-8 said axial restrictor (12a''-12d'') comprises two restrictor members (17 & 19) each provided on a surface of one of said rotary members

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(2 & 4) that is opposite to the axially facing surface of said one of said rotary members and sandwiching said rotary members.

Claim 21: Sadatomo shows in Figs. 7 & 8 said restrictor members (17 & 19) are fixed in position such that the distance therebetween is constant.

4. Claims 2, 11 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo and Rose as applied to claims 1 & 14 above, in view of Tajima et al. US 2002/0068639 (Tajima). Sadatomo shows in Figs. 1 & 5-8: said rotary members (17 & 19), said rolling elements (inherently) and said retainer (10) are made of a metallic material but does not expressly disclose surfaces that are subjected to hardening treatment.

Tajima teaches a surface-hardened layer to improve durability (§ [0198] & [0203] – [0205]). At the time of the invention, it would have been obvious to one having ordinary skill in the art to provide the rotary members, rolling elements, and retainer with surfaces that are subjected to hardening treatment to improve these elements with increased durability.

Claim 11: Tajima, in modifying Sadatomo, teaches (§ [0198]) surfaces of said guide grooves that are brought into contact with said rolling elements, surfaces of said rolling elements and/or surfaces of said retainer that are brought into contact with said rolling elements are subjected to surface heat treatment. The reduction of the friction coefficient of these surfaces is merely intended use.

Claim 15: Sadatomo does not expressly disclose where the surfaces of said rotary members (2 & 4) that are brought into said restrictor members (17 & 19) and/or surfaces of said restrictor members that are brought into contact with said rotary members are subjected to one or a plurality of surface treatments selected from dry plating, wet

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plating, melting treatment, flame spraying, ion implantation, sulfidization, chemical conversion, surface heat treatment and shot peening to reduce the friction coefficient of these surfaces. However, it would be obvious to provide a surface treatment for the same reason as that noted above.

5. Claims 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo and Rose as applied to claims 1 & 4 above, in view of Bilz et al. US 6,497,622 (Bilz). Sadatomo shows in Figs. 1 & 5 said rolling elements are spherical members. Sadatomo does not expressly disclose each of said guide grooves has a plurality of surfaces that simultaneously contact the corresponding rolling element from both sides of the guide groove with respect to the width direction of the guide groove.

Bilz teaches guide grooves having a plurality of surfaces (Figs. 7-18) that simultaneously contact the corresponding rolling element from both sides of the guide groove with respect to the width direction of the guide groove in order to keep the inner friction low and accelerate the running-in phase (Col. 2, L30-35). At the time of the invention, it would have been obvious to replace the groove shape of Sadatomo with those of Bilz to improve the grooves with lower inner friction and an accelerated running-in phase.

Claim 6: Bilz, in modifying Sadatomo, shows in Fig. 18 each of said plurality of surfaces of each of said guide grooves is a curved surface having a radius of curvature greater than the radius of said rolling elements.

Claim 7: Bilz, in modifying Sadatomo, shows in Fig. 7 each of said plurality of surfaces of each of said guide grooves is a flat surface.

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Claim 8: Bilz, in modifying Sadatomo, shows in Fig. 8 each of said guide grooves has a portion which does not contact the corresponding rolling element and defines a recess.

Claim 9: The limitations of this claim have been addressed above.

6. Claims 12 & 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo and Rose as applied to claims 1 & 14 above, in view of Hirota et al. US 2003/0106758 (Hirota). Sadatomo does not expressly disclose a lubricant is disposed between contact surfaces of said guide grooves and said rolling elements and/or between contact surfaces of said retainer and said rolling elements.

Hirota teaches the use of lubricant to reduce friction and improve durability (§ [0068]). At the time of the invention, it would have been obvious to one having ordinary skill in the art to provide the shaft coupling of Sadatomo with the lubricant as taught by Hirota to improve the device with reduced friction and increased durability.

Claim 16: Sadatomo does not expressly disclose a lubricant is disposed between contact surfaces of said rotary members and said restrictor members. However, it would be obvious to do so for the same reason as that noted above.

7. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo and Rose in view of Hirota as applied to claim 12 above, and further in view of Tajima. Sadatomo does not expressly disclose a lubricant is retained in the shaft coupling, the shaft coupling further comprising means for preventing entry of foreign matter into the shaft coupling from outside the shaft coupling.

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Tajima teaches (§ [0113]) a means for preventing entry of foreign matter into the shaft coupling from the outside of the shaft coupling. At the time of the invention, it would have been obvious to one having ordinary skill in the art to provide the shaft coupling of Sadatomo with the preventing means as taught by Tajima to improve the device by preventing entry of water or foreign matter from the outside and leakage of grease contained inside. It would have been obvious to retain lubricant in the shaft coupling for the same reason as that noted above.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo and Rose as applied to claim 14 above, in view of Frost, US 6,609,454. Sadatomo does not expressly disclose a sliding member is disposed between said rotary members and said restrictor members.

Frost teaches a sliding member (28) made from fluoro-elastomers having a low unit cost (Col. 2, L43-67 & Col. 3, L30-50). At the time of the invention, it would have been obvious to provide the restrictor members of Sadatomo with the sliding member of Frost to improve the sliding of the coupling while maintaining low manufacturing cost.

9. Claims 18-20 & 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sadatomo and Rose as applied to claim 14 above, in view of Honda et al. US 6,370,772. Sadatomo exemplifies in Figs. 2-4 means for making the distance between said restrictor members variable. Sadatomo does not expressly disclose whereby the force with which said rotary members are sandwiched between said restrictor members is adjustable.

Honda teaches (Col. 5, L3-15 & Col. 6, L50-65) restrictor members whereby the force with which said rotary members are sandwiched between said restrictor members is adjustable

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(Figs. 3, 4b & 6). At the time of the invention, it would have been obvious to one having ordinary skill in the art to provide the restrictor members of Sadatomo with means to adjust the sandwiching force of the rotary members as taught by Honda in order to repeatedly and reversibly fix the rotary members.

Claim 19: Honda shows in Fig. 3 said means is a thread coupling means through which said restrictor members are threadedly coupled together.

Claim 20: Honda, in modifying Sadatomo, shows in Fig. 6 an elastic member (180) biasing each of said restrictor members against the axially opposed rotary member, thereby producing the force with which said rotary members are sandwiched between said restrictor members.

Claim 22: Honda, in modifying Sadatomo, teaches in Fig. 6 a coupling member (228) extending through guide holes (88, 92) each formed in one of said rotary members, said restrictor members being coupled together through said coupling member, and an elastic member (180) mounted on an outer peripheral surface of said coupling member and/or elastic members each mounted on an inner surface of one of said guide holes.

Claim 23: Honda discloses said elastic member or elastic members are made of a material (Viton Rubber, Col. 6, L50-65) having high sliding properties.

Claim 24: Honda discloses said elastic member or elastic members are made of a material (Viton Rubber, Col. 6, L50-65) comprising a rubber matrix to which a fluorine material is added.

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Response to Arguments

10. Applicant's arguments filed 05/26/2009 have been fully considered but they are not persuasive. Applicant argues that the elastic member of Honda is a part of the rotary member and does not bias the restrictors against the rotary member as per claim 20. However, Honda discloses (Col. 6, L63-65) that the rubber material is molded onto the steel rim which allows greater rim engagement and bond strength. This bond strength when properly disposed on the restrictor members (17 & 19) of Sadatomo would create a tension that would bias the flanges of the restrictor members against the elastic member as well as the rotary members (6 & 8).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLIFFORD J. LOUDEN whose telephone number is (571)270-5504. The examiner can normally be reached on Monday through Thursday, 8:00AM to 4:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel P. Stodola can be reached on (571)272-7087. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Greg Binda/
Primary Examiner, Art Unit 3679

/CLIFFORD J LOUDEN/
Examiner, Art Unit 3679
Wednesday, August 12, 2009